WATER RESOURCES REVIEW for JANUARY 1976

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

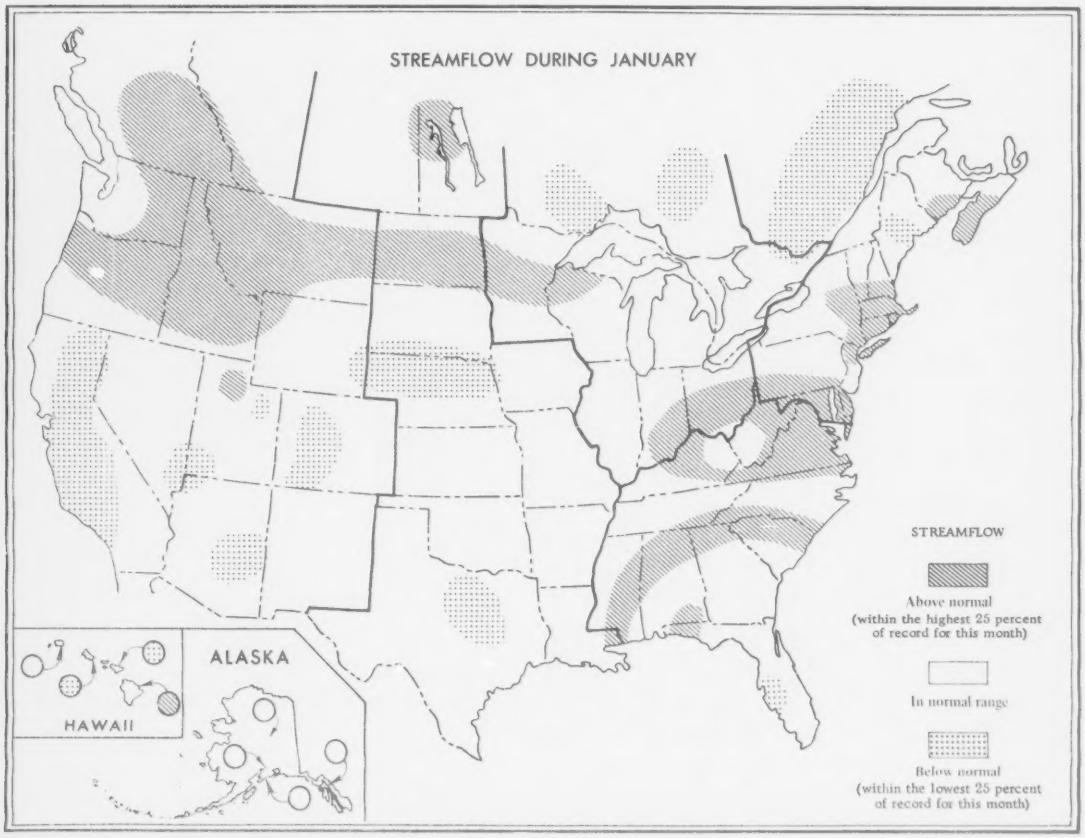
CANADA
DEPARTMENT OF THE ENVIRONMENT
WATER RESOURCES BRANCH

STREAMFLOW AND GROUND-WATER CONDITIONS

Streamflow decreased in southern Canada (except in southwestern New Brunswick) and in many central and western States and Alaska. Flows decreased also in parts of Maine, New Hampshire, Vermont, and Florida, but generally increased in the eastern States and in parts of Arizona, California, Hawaii, and Oregon.

Monthly mean flows remained above the normal range in a large area in northwestern United States and the adjacent area of Canada, and in smaller areas in eastern Canada and eastern and central United States. Below-normal flows persisted in parts of Hawaii and in some central and western States. Winter drought conditions at monthend in California were described as among the worst in the State's history.

Flooding occurred in Maryland, New York, Pennsylvania, and Vermont, and daily mean discharges were highest of record for January in parts of Maryland and New Brunswick.



CONTENTS OF THIS ISSUE: Northeast, Southeast, Western Great Lakes region, Midcontinent, West, Alaska, Hawaii; Dissolved solids and water temperatures for January at downstream sites on six large rivers; Usable contents of selected reservoirs near end of January 1976; Flow of large rivers during January 1976; The 1973 Mississippi River basin flood; Compilation and analysis of meteorologic, streamflow, and sediment data

NORTHEAST

[Atlantic Provinces and Quebec; Delaware, Maryland, New York, New Jersey, Pennsylvania, and the New England States]

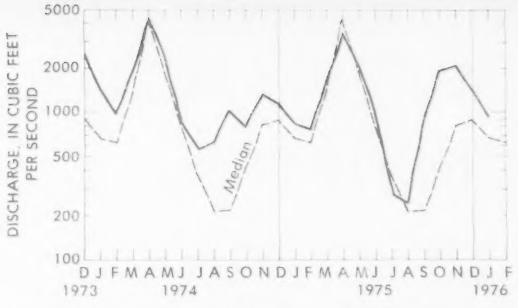
STREAMFLOW GENERALLY DECREASED SEASONALLY IN THE NORTHERN HALF OF THE REGION AND INCREASED IN THE SOUTHERN HALF. FLOWS REMAINED ABOVE THE NORMAL RANGE IN PARTS OF THE NEW ENGLAND STATES, NEW YORK, AND THE ATLANTIC PROVINCES. FLOODING OCCURRED IN THE EXTREME SOUTHERN PART OF THE REGION AT THE BEGINNING OF THE MONTH AND ICE JAMS CAUSED SOME FLOODING IN THE SOUTHERN AND CENTRAL PARTS NEAR MONTHEND.

Rapid runoff from rain and snowmelt at the beginning of the month resulted in severe flooding as well as record-high monthly and daily mean discharges in parts of the Potomac River basin in the extreme southern part of the region. In western Maryland the monthly mean discharge of 296 cfs, and the daily mean of 3,030 cfs on January 1, at the index station Seneca Creek at Dawsonville (drainage area, 101 square miles), tributary to Potomac River, were highest for the month since records began in September 1930. Similarly, the daily mean discharge of 31,200 cfs on January 1 in Potomac River at Paw Paw, W. Va. (drainage area, 3,109 square miles) was the highest for January since records began in October 1938.

Near monthend, increased runoff from snowmelt and rain broke up ice cover on many streams in the southern and central parts of the region and ice jams caused considerable flooding. Evacuation of homes in parts of New York, Vermont, New Jersey, and Pennsylvania was reported. At monthend, snow cover of as much as 14 to 18 inches in the upper reaches of Susquehanna River basin in New York and Pennsylvania represents a potential flood threat.

In east-central New York, monthly mean flow of Mohawk River at Cohoes increased contraseasonally and was above the normal range for the 5th time in the past 7 months. In the adjacent State of Vermont, where monthly mean discharge of White River at West Hartford remained in the above-normal range from September through December, flow decreased seasonally into the normal range but remained above median (see graph). In western Massachusetts, monthly mean discharge of Ware River at Coldbrook increased seasonally, remained above the normal range, and was the 3d highest for January since records began in February 1928.

A flood potential exists also in the southern part of the Vermont-New Hampshire-Massachusetts area where above-normal water content of the remaining snowpack



Monthly mean discharge of White River at West Hartford, Vt. (Drainage area, 690 sq mi; 1,790 sq km)

was reported at monthend. In Connecticut, monthly mean flows increased, were above the normal range, and were more than 2 times the January median flow at all index stations in the State.

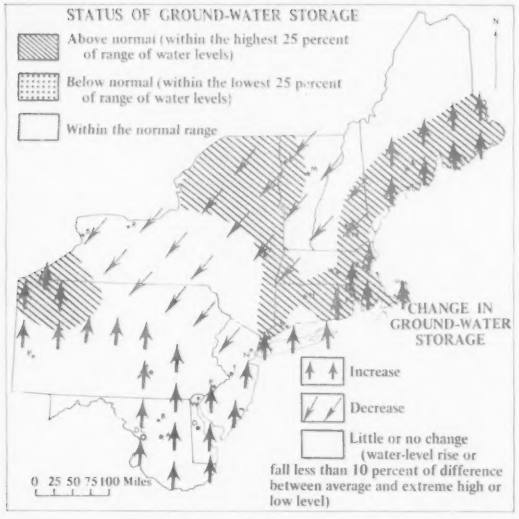
In the northern part of the region, monthly mean discharges decreased into the below-normal range in a large area in eastern Quebec, west of the St. Lawrence River, and in a smaller area in central Maine, partly as the result of below-normal temperatures. In southern Nova Scotia, high carryover flow from December contributed to the continuation of above-normal monthly mean discharge in La Have River at West Northfield. In southern New Brunswick, high carryover flow from December, augmented by sharply increased runoff from intense rains on the 28th, held monthly mean discharge of Lepreau River at Lepreau (drainage area, 92.1 square miles) in the above-normal range and more than 2 times the median flow for the month. The daily mean discharge of 3,740 cfs on the 29th was the highest for January at that site since records began in 1916.

Ground-water levels rose in many coastal areas and also in much of central and western Pennsylvania and eastern Maryland (see map on page 3). Levels declined in most of New York State, New Hampshire, Vermont, western Massachusetts, and northern New Jersey. Monthend levels were near or above average throughout the region. Above-average levels persisted in eastern Maine, southeastern New Hampshire, eastern Massachusetts, Rhode Island, most of Connecticut, and in northeastern and extreme southeastern and southwestern parts of New York State and adjacent northwestern Pennsylvania. Levels in some parts of Connecticut, Massachusetts, and Maine were highest for end of January in the past 20 to 30 years.

SOUTHEAST

[Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia]

STREAMFLOW GENERALLY INCREASED SEASONALLY THROUGHOUT THE REGION EXCEPT IN WEST-CENTRAL FLORIDA. FLOWS


STATUS OF GROUND-WATER STORAGE
Above normal (within the highest 25 percent of range of water levels)
Below normal (within the lowest 25 percent of range of water levels)
Within the normal range
CHANGE IN GROUND-WATER STORAGE
Increase
Decrease
Little or no change (water-level rise or fall less than 10 percent of difference between average and extreme high or low level)
0 25 50 75 100 Miles

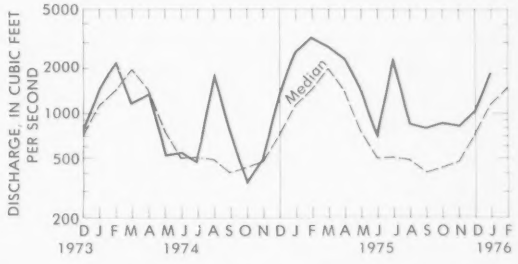
Map shows ground-water storage near end of January and change in ground-water storage from end of December to end of January.

REMAINED IN THE ABOVE-NORMAL RANGE IN PARTS OF FLORIDA AND ALABAMA AND INCREASED INTO THAT RANGE IN PARTS OF ALL OTHER STATES EXCEPT MISSISSIPPI AND TENNESSEE. SOME FLOODING OCCURRED IN THE NORTHERN PART OF THE REGION AT THE BEGINNING OF THE MONTH.

Moderate flooding occurred in the Potomac River basin in the extreme northern part of the region on January 1. Coincident flooding occurred in tributaries to the Potomac River in Maryland. Daily mean discharge in Potomac River at Paw Paw, W. Va., on January 1 was highest of record for January (see text for Northeast region). At the index station, Greenbrier River at Alderson, W. Va. (drainage area, 1,357 square miles) the daily mean discharge of 27,500 cfs January 1 was less than the maximum of record for January but was a significant part of the total runoff for the month, one-half of which occurred during the first four days. In central Virginia, the daily mean discharge of 4,190 cfs on January 1 in Slate River at Arvonia was only 5 percent less than the maximum for the month in 50 years of record. In the extreme western part of Virginia, where mean flow of North Fork Holston River near Saltville was only 35 percent of median in December, daily mean discharge increased sharply on January 1 to 3,970 cfs and the resulting monthly mean discharge was almost twice the median and above the normal range. In the southeastern and northeastern parts of the State, the respective monthly mean flows of Nottaway River near Stony Creek and Rapidan River near Culpeper also increased into the above-normal range and were more than 2 times the January median, as a result of runoff from rains near monthend.

In central Kentucky, high carryover flow from December, augmented by runoff from seasonal rains and snowmelt, resulted in sharply increased flow in Green River at Munfordville, where monthly mean discharge was above the normal range and more than twice the January median flow. In Tennessee, where precipitation has been below normal for 3 consecutive months, monthly mean flows increased seasonally at all index stations and remained well above median but within the normal range.

In extreme western North Carolina, monthly mean discharge in the upper reaches of French Broad River at Asheville, increased sharply and was above the normal range partly as a result of high runoff at the beginning of the month. Elsewhere in the State, flows increased seasonally at all index stations but remained within the normal range. In northeastern South Carolina, high carryover flow from December, augmented by a seasonal increase during January, held monthly mean discharge of Lynches River at Effingham in the above-normal range, where it has been in 13 of the past 14 months (see graph).



Monthly mean discharge of Lynches River at Effingham, S.C. (Drainage area, 1,030 sq mi; 2,670 sq km)

In northern Alabama and the adjacent area of northwestern Georgia, monthly mean discharges in Tombigbee River at Demopolis lock and dam, near Coatopa, Ala., Cahaba River at Centreville, Ala., and Etowah River at Canton, Ga., increased sharply as a result of increased runoff from rains near monthend and were in the above-normal range for the 4th time in the past 5 months. Elsewhere in those two States, flows increased seasonally and were greater than median but were within the normal range.

In Mississippi, monthly mean flows increased seasonally and were in the normal range except in the south-central part of the State where mean flow of Pearl River, as measured at Bogalusa, La., near the State line, increased sharply as a result of runoff from rain early in

January, and was above the normal range for the 8th time in the past 9 months.

In northwestern Florida, and the adjacent area of southeastern Alabama, monthly mean flow of Shoal River near Crestview, Fla. decreased contraseasonally from the unusually high flow of December but remained above the normal range for the 10th consecutive month. Also in northern Florida, the discharge of Silver Springs decreased 23 cfs, to 664 cfs; 83 percent of normal. In the west-central part of the State, mean flow of Peace River at Arcadia continued to decrease seasonally, was only 45 percent of median, 2 percent greater than in January 1975, and was below the normal range. In southwestern Florida, flow southward through the Tamiami Canal outlets, 40-mile bend to Monroe, decreased 14.8 cfs, to 12.0 cfs; 36 percent of normal. At Miami, in southeastern Florida, flow in Miami Canal increased 2 cfs, to 135 cfs; 75 percent of normal.

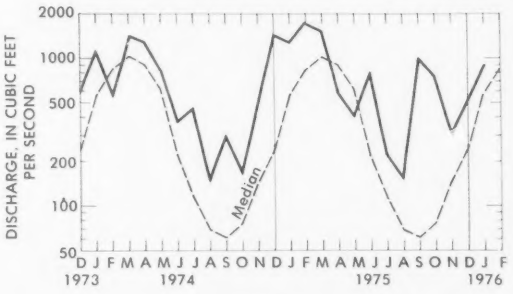
Ground-water levels rose in much of the region, including levels in most water-table wells in Alabama, Kentucky, North Carolina, and West Virginia, and also in northern Florida and the Piedmont of Georgia. In near-coastal Georgia, levels rose at least slightly in areas outlying from the heavily pumped aquifers of Brunswick and Savannah. In Florida, levels declined in central and southeastern parts of the State; monthend levels in the southeastern part ranged from about average to 2 feet below average. Monthend levels were above long-term averages in North Carolina and in western West Virginia; and were below average in eastern West Virginia. In the heavily pumped Jackson area of central Mississippi, levels generally did not change in the Sparta Sand and Cockfield Formation; in the northwestern part of the State, levels continued to rise in the shallow Mississippi River alluvium.

WESTERN GREAT LAKES REGION

[Ontario; Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin]

STREAMFLOW GENERALLY DECREASED IN NORTHERN AND CENTRAL PARTS OF THE REGION BUT INCREASED IN INDIANA AND OHIO. FLOWS REMAINED ABOVE THE NORMAL RANGE IN PARTS OF MINNESOTA AND INDIANA AND BELOW THAT RANGE IN PARTS OF ONTARIO.

In southern Indiana, high carryover flow from December, augmented by increased runoff near monthend, held monthly mean discharge in the above-normal range. In the adjacent areas of southern Ohio, flow at the index station, Scioto River at Higby, also increased sharply near monthend and monthly mean discharge was above the normal range and more than 2 times the January median flow. In extreme eastern Ohio, flow of Little Beaver Creek near East Liverpool increased seasonally and remained above median for the 8th consecutive month (see graph).



Monthly mean discharge of Little Beaver River near East Liverpool, Ohio (Drainage area, 496 sq mi; 1,285 sq km)

In Michigan's Lower Peninsula, where monthly mean discharges were above the normal range in December, flows decreased as a result of below-normal temperatures and were in the normal range.

In northwestern Wisconsin, where flows of Chippewa River at Chippewa Falls and Jump River at Sheldon continued to decrease seasonally, monthly mean discharge remained above the normal range as a result of high carryover flow from December. In the adjacent area of central Minnesota, monthly mean flow of Crow River at Rockford decreased seasonally but remained in the above-normal range as a result of increased flow at monthend. In west-central Minnesota, monthly mean discharge of Buffalo River near Dilworth continued to decrease seasonally but remained above the normal range because of high carryover flow from December.

In southern Ontario, monthly mean flows at the index stations, Missinaibi River at Mattice and English River at Umfreville decreased seasonally, remained below median, and were in the below-normal range. Flows at other index stations in the Province also decreased seasonally but were in the normal range.

Elsewhere in the region, flows generally decreased and were near or slightly greater than median.

Ground-water levels generally rose in Ohio and Indiana; and declined in Michigan, Wisconsin, and Minnesota. Monthend levels were above average in Ohio and Michigan; near or above average in Wisconsin; and below average in Minnesota. In the heavily pumped Minneapolis-St. Paul, Minn., area, artesian levels changed very little in wells tapping the Prairie du Chien-Jordan aquifer and continued to rise in the Mt. Simon-Hinckley aquifer; levels remained below average in both aquifers.

MIDCONTINENT

[Manitoba and Saskatchewan; Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas]

STREAMFLOW GENERALLY DECREASED IN THE NORTHERN AND CENTRAL PARTS OF THE REGION, EXCEPT IN PARTS OF SOUTH DAKOTA AND KANSAS, AND INCREASED SEASONALLY IN THE SOUTHERN STATES. FLOWS REMAINED IN THE ABOVE-NORMAL RANGE IN MANITOBA AND DECREASED INTO THE BELOW-NORMAL RANGE IN NEBRASKA.

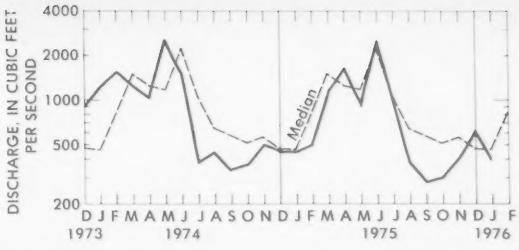
In Cannonball River basin in southwestern North Dakota, where mean flow in January usually is much less than in December, monthly mean discharge at the index station at Breien increased contraseasonally as a result of snowmelt runoff, was more than 6 times the January median flow, and was well above the normal range. In the eastern part of the State, mean flow of Red River of the North at Grand Forks remained in the above-normal range where it has been in 9 of the last 10 months, as a result of high tributary inflow from Minnesota.

In south-central Manitoba, high carryover flow from December held monthly mean discharge of Waterhen River below Waterhen Lake in the above-normal range for the 19th time in the past 21 months. Also in the south-central part of the Province, the level of Lake Winnipeg at Gimli averaged 714.95 feet above mean sea level, 1.91 feet higher than the January long-term mean, 0.02 foot lower than last month, and 1.11 feet lower than the maximum of record for January, which occurred last year. The record of Lake Winnipeg levels began in May 1913 at Winnipeg Beach.

In South Dakota, there was no flow at the index station, Bad River near Fort Pierre, which is normal for the month, but no flow has occurred at that station since September 1975.

In northwestern Nebraska, monthly mean discharge at the index station, Niobrara River above Box Butte Reservoir, decreased seasonally and remained in the below-normal range for the 3d consecutive month. In the northeastern part of the State, monthly mean flow of Elkhorn River at Waterloo also decreased seasonally and was below the normal range for the 5th time in the past 6 months (see graph).

In Iowa, and the adjacent area of northern Missouri, mean flows decreased and generally were less than the median flows for the month. In southern Missouri, monthly mean flow in Gasconade River at Jerome decreased contraseasonally and was slightly greater than median.



Monthly mean discharge of Elkhorn River at Waterloo, Nebr. (Drainage area, 6,900 sq mi; 17,900 sq km)

In Kansas, mean flows increased in Saline River near Russell, in the northwest, and decreased in Little Blue River near Barnes and Arkansas River at Arkansas City, in the north-central and south-central parts of the State, respectively.

In Oklahoma, monthly mean discharge of Washita River near Durwood remained essentially unchanged from December, was slightly greater than median, and was in the normal range. No surface runoff occurred in the State during the month.

In southern Arkansas, where mean flow of Saline River near Rye was only one-fourth of median in December, monthly mean discharge increased seasonally but was only 53 percent of median in January.

In Louisiana, mean flows increased seasonally in all parts of the State and were near or slightly above median except in the west-central part where monthly mean discharge of Calcasieu River near Oberlin was slightly less than one-half the January median flow.

In east-central Texas, monthly mean flow of North Bosque River near Clifton increased seasonally but remained far below median for the 4th consecutive month and below the normal range for the 2d consecutive month (see graph on page 6). Also in eastern Texas, monthly mean discharge of Neches River near Rockland increased seasonally but was only about one-half of the median flow for January.

Ground-water levels generally fell in North Dakota and Iowa; changed only slightly in Kansas; and rose in Nebraska and in several major aquifers of Arkansas and Louisiana. However, the level declined slightly in the key well screened in the Sparta sand of northern Louisiana and fell more than 7 feet in the 2000-foot sand in the Baton Rouge area. Monthend levels were below average in eastern Iowa, and were above average elsewhere in the State. Monthend levels were near average in Nebraska (except in some heavily pumped areas), Kansas, and North Dakota. In the rice-growing area of east-central Arkansas, monthend levels in the shallow aquifer were in the same range of values that have occurred since 1961, and were 12 feet above average in the deep aquifer

Monthly mean discharge of North Bosque River near Clifton, Tex. (Drainage area, 972 sq mi; 2,517 sq km)

(Sparta Sand). In the industrial aquifer of central and southern Arkansas (Sparta Sand), the monthend level at Pine Bluff was lowest of record for January at Pine Bluff and 3 feet above average at El Dorado. In Texas, levels rose in the Evangeline aquifer at Houston; but declined in the bolson deposits at El Paso and in the Edwards Limestone at Austin and San Antonio. Monthend levels were above average at Austin and San Antonio; and below average at Houston (lowest of record for January) and El Paso (alltime low).

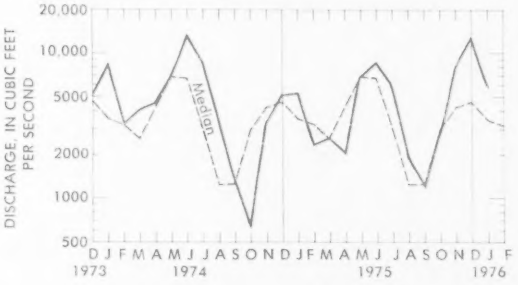
WEST

[Alberta and British Columbia; Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming]

STREAMFLOW GENERALLY DECREASED SEASONALLY IN ALL PARTS OF THE REGION BUT INCREASED IN PARTS OF ARIZONA AND OREGON. MONTHLY MEAN DISCHARGES REMAINED ABOVE THE NORMAL RANGE IN A LARGE AREA IN THE NORTHWESTERN PART OF THE REGION, AND REMAINED BELOW THAT RANGE IN SMALLER AREAS IN ARIZONA, COLORADO, UTAH, AND WYOMING. FLOWS DECREASED INTO THE BELOW-NORMAL RANGE IN MUCH OF CALIFORNIA. WINTER DROUGHT CONDITIONS IN THAT STATE AT MONTHEND WERE REPORTED TO BE AMONG THE WORST IN THE STATE'S HISTORY.

Monthly mean discharge increased seasonally at all index stations in Oregon except in Wilson River at Tillamook, in the northwestern coastal area, where flow decreased seasonally but remained above the normal range. In the northeastern and west-central parts of the State, respectively, monthly mean flows of John Day River at Service Creek, and Willamette River at Salem, increased seasonally and were above the normal range.

In Washington, mean flow of Skykomish River near Gold Bar decreased seasonally from the unusually high flow of December and remained above median for the 3d consecutive month (see graph). In the eastern part of



Monthly mean discharge of Skykomish River near Gold Bar, Wash. (Drainage area, 535 sq mi; 1,386 sq km)

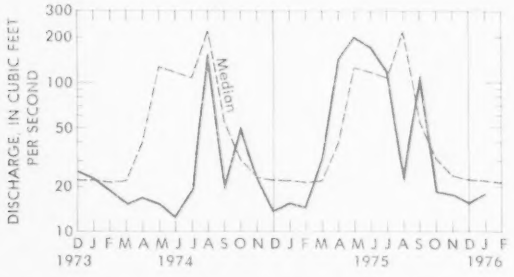
the State, monthly mean flow of Spokane River at Spokane also decreased seasonally and remained above median. In the adjacent State of Idaho, monthly mean flows remained above the normal range at all index stations and decreased seasonally, except in Snake River at Weiser, near the Idaho-Oregon border, where mean discharge increased seasonally.

In Montana, and the adjacent southern part of the Provinces of Alberta and British Columbia, monthly mean flows decreased seasonally and remained in the above-normal range.

In California, where monthly mean flows in December at all index stations except Arroyo Seco near Pasadena, in the southern coastal area, were in the normal range, flows decreased sharply in January as the winter drought conditions intensified, and were below the normal range except in the extreme northwestern coastal area. This agricultural winter drought period has severely affected grasslands and crops dependent on rainfall and, at monthend, was reported to be among the worst in California history. For only the second time in more than 100 years of record, no rainfall was reported in southern California during the month of January. In the Los Angeles area, total precipitation for the 7-month period July 1, 1975 to January 31, 1976, was reported to be only about 0.6 inch. Average for that period is 7.46 inches for that area. Monthly mean discharge of Arroyo Seco near Pasadena decreased contraseasonally, remained below the normal range, and was only 17 percent of the January median flow. In the east-central

part of the State, monthly mean flow of Kings River above North Fork also decreased contraseasonally, was below the normal range, and was only 41 percent of median. In northeastern California, mean flow of North Fork American River at North Fork Dam, tributary to Sacramento River, continued to decrease contraseasonally, was below the normal range, and was only 22 percent of the January median. Similarly, monthly mean discharge of Sacramento River at Verona decreased contraseasonally, was in the below-normal range, and was only 47 percent of median for January.

In the extreme northwestern part of Arizona, monthly mean flow of Virgin River at Littlefield increased slightly but remained below the normal range for the 5th consecutive month. In southeastern Arizona, monthly mean discharge of Salt River near Roosevelt decreased contraseasonally into the below-normal range. In New Mexico, monthly mean discharges decreased at all index stations except Pecos River at Santa Rosa, where mean flow increased slightly but remained below median for the 4th consecutive month (see graph).



Monthly mean discharge of Pecos River at Santa Rosa, N. Mex. (Drainage area, 2,650 sq mi; 6,864 sq km)

In Colorado, mean flows generally decreased seasonally and were below the normal range except in Roaring Fork River at Glenwood Springs, where monthly mean flow remained in the normal range and was greater than median for the 3d consecutive month.

In Utah, monthly mean discharges decreased seasonally at all index stations and were near or slightly greater than January median flows except in northeastern Utah, where mean flow of Whiterocks River near Whiterocks remained below the normal range for the 4th consecutive month. Also in northern Utah, the level of Great Salt Lake rose 0.20 foot during the month (to 4,200.80 feet above mean sea level), 1.15 feet higher than a year ago, and 2.80 feet higher than the long-term January average.

Storage in most major reservoirs was above average at monthend. The net decrease in storage in the Colorado River Storage Project was 358,360 acre-feet during the month.

Ground-water levels generally rose in Utah (except at Blanding in southeast), Washington (except at Cashmere in central part of State), and in north-central and east-central Nevada. Levels changed only slightly in southern New Mexico; declined slightly in Idaho; and declined in Montana. Monthend levels were above average in Washington and much of Idaho and Montana as well as in north-central and east-central Nevada. In south-central Idaho, monthend levels were below average in the Rupert-Minidoka area. In Utah, monthend levels were below-average except for continuing above-average levels at Logan (in norhteast) and Blanding (in southeast).

ALASKA

Streamflow continued to decrease seasonally throughout the State but runoff from rain and snowmelt in southern coastal basins reduced the rate of decline to less than normal. For example, at the index station, Gold Creek near Juneau, monthly mean discharge in January was only 9 percent less than in December, compared to a normal decrease in median flow of 65 percent, and was in the normal range. Precipitation at Juneau in January was reported to be near the highest of record for the month. In south-central Alaska, where monthly mean flow of Little Susitna River near Palmer was above the normal range from September through December, mean discharge in January decreased into the normal range as a result of minimal precipitation and below-freezing temperatures. In the east-central part of the State, high carryover flow from December held monthly mean discharge of Tanana River at Nenana (drainage area, 25,600 square miles) in the above-normal range for the 5th consecutive month. The daily mean discharge of 7,400 cfs on January 1 was highest for the month since records began in 1963. In the adjacent tributary basin of Chena River, monthly mean flow at the index station at Fairbanks continued to decrease seasonally and remained below median for the 4th consecutive month.

In the Anchorage area, ground-water levels fell as much as 1 foot in water-table wells, and also fell in confined aquifers except where municipal pumpage was reduced.

HAWAII

Streamflow was variable throughout the State and rainfall was reported to be normal. On the island of Kauai, where monthly mean flow of East Branch of North Fork Wailua River near Lihue was in the below-normal range from July through December, flow increased contraseasonally and was in the normal range. In

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR JANUARY AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	January data of following calendar years	Stream discharge during month	Dissolved-solids concentration during month[a]		Dissolved-solids discharge during month[a]			Water temperature during month		
			Mean (cfs)	Minimum (mg/l)	Maximum (mg/l)	Mean	Minimum	Maximum	Mean, in °C	Minimum, in °C	Maximum, in °C
						(tons per day)					
	NORTHEAST										
01463500	Delaware River at Trenton, N.J.	1976	20,110	72	126	5,600	2,700	20,850	1.0 (34°F)	0 (32°F)	2.5 (36°F)
	(Morrisville, Pa.)	1945–74	12,360 [10,240[b]]	62 (Jan. 21-31,1951; Jan. 1-10, 1960)	201 (Jan. 24, 1959)	.....	998 (Jan. 19, 1965)	9,730 (Jan. 27, 1964)	.....	0 (32°F)	7.5 (46°F)
04264331	St. Lawrence River at Cornwall, Ontario, near	1976	246,900	166	168	111,000	94,900	122,000	0.5 (33°F)	0 (32°F)	1.0 (34°F)
	Massena, N.Y. (streamflow station formerly at Ogdensburg, N.Y.)	1966–74	232,700 [223,000[b]]	.....	.....	.....	.....	.....	.....	0 (32°F)	3.0 (38°F)
	SOUTHEAST										
07289000	Mississippi River at Vicksburg, Miss	1976	711,700 [535,400[b]]	161	204	349,000	282,000	421,000	4.5 (40°F)	4.0 (39°F)	6.5 (44°F)
	WESTERN GREAT LAKES REGION										
03612500	Ohio River at lock and dam 53, near Grand Chain, Ill.	1976	535,700	148	192	.....	133,000	350,000	.....	5.0 (41°F)	7.0 (44°F)
	(25 miles west of Paducah, Ky.; streamflow station at at Metropolis, Ill.)	1955–74	339,900 [315,300[b]]	98 (Jan. 21, 1973)	382 (Jan. 13, 1964)	.....	28,500 (Jan. 20, 1956)	448,000 (Jan. 6, 1970)	.....	0 (32°F)	10.0 (50°F)
	MIDCONTINENT										
06934500	Missouri River at Hermann, Mo. (60 miles west of St. Louis, Mo.)	1976	40,400 [32,940[b]]	159	477	40,300	26,700	53,700	0.5 (33°F)	0 (32°F)	4.5 (40°F)
	WEST										
14128910	Columbia River at Warrendale, Oreg.	1976	201,300	79	92	45,800	32,300	57,100	7.0 (44°F)	6.5 (44°F)	8.0 (46°F)
	(30 miles east of Portland, Oreg.; streamflow station at The Dalles, Oreg.)	1968–74	168,100 [112,300[b]]	.....	.....	.....	.....	.....	.....	1.0 (34°F)	6.0 (43°F)

[a] Dissolved-solids concentrations when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b] Median of monthly values for 30-year reference period, water years 1941–70, for comparison with data for current month.

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF JANUARY 1976

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	End of Dec. 1976	End of Jan. 1976	End of Jan. 1975	Average for end of Jan.	Normal maximum
	Percent of normal maximum				
NORTHEAST REGION					
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	54	77	59	55	223,400 (a)
QUEBEC					
Allard (P)	84	66	57	68	280,600 ac-ft
Gouin (P)	83	73	69	86	6,954,000 ac-ft
MAINE					
Seven reservoir systems (MP)	55	49	46	48	178,500 mcf
NEW HAMPSHIRE					
First Connecticut Lake (P)	45	41	38	36	3,330 mcf
Lake Francis (FPR)	82	51	54	51	4,326 mcf
Lake Winnipesaukee (PR)	69	62	57	56	7,200 mcf
VERMONT					
Harriman (P)	46	15	32	47	5,060 mcf
Somerset (P)	84	79	66	58	2,500 mcf
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	75	77	74	70	3,394 mcf
NEW YORK					
Great Sacandaga Lake (FPR)	47	38	43	44	34,270 mcf
Indian Lake (FMP)	74	59	60	53	4,500 mcf
New York City reservoir system (MW)	91	88	94	.....	547,500 mg
NEW JERSEY					
Wanaque (M)	101	100	99	76	27,730 mg
PENNSYLVANIA					
Pymatuning (FMR)	84	84	84	83	8,191 mcf
Wallenpaupack (P)	69	66	74	51	6,875 mcf
MARYLAND					
Baltimore municipal system (M)	100	100	93	85	85,340 mg
SOUTHEAST REGION					
NORTH CAROLINA					
Bridgewater (Lake James) (P)	80	82	86	78	12,580 mcf
Narrows (Badin Lake) (P)	98	91	100	97	5,617 mcf
High Rock Lake (P)	54	56	90	69	10,230 mcf
SOUTH CAROLINA					
Lake Murray (P)	69	78	85	62	70,300 mcf
Lakes Marion and Moultrie (P)	59	61	90	67	81,100 mcf
SOUTH CAROLINA–GEORGIA					
Clark Hill (FP)	62	69	73	56	75,360 mcf
GEORGIA					
Burton (PR)	61	67	67	55	104,000 ac-ft
Sinclair (MPR)	69	86	96	79	214,000 ac-ft
Lake Sidney Lanier (FMPR)	61	65	52	52	1,686,000 ac-ft
ALABAMA					
Lake Martin (P)	71	85	78	67	1,373,000 ac-ft
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	30	38	45	32	1,156,000 cfsd
Douglas Lake (FPR)	13	30	21	13	703,100 cfsd
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	42	51	48	41	510,300 cfsd
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	34	40	51	32	1,452,000 cfsd
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	38	45	53	39	745,200 cfsd
WESTERN GREAT LAKES REGION					
WISCONSIN					
Chippewa and Flambeau (PR)	87	68	55	41	15,900 mcf
Wisconsin River (21 reservoirs) (PR)	69	50	31	32	17,400 mcf
MINNESOTA					
Mississippi River headwater system (FMR)	22	17	27	21	1,640,000 ac-ft
MIDCONTINENT REGION					
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	87	86	86	.....	22,640,000 ac-ft
SOUTH DAKOTA					
Angostura (I)	63	64	65	75	127,600 ac-ft
Bell Fourche (I)	41	51	44	48	185,200 ac-ft
Lake Francis Case (FIP)	57	64	66	65	4,834,000 ac-ft
Lake Oahe (FIP)	82	82	81	.....	22,530,000 ac-ft
Lake Sharpe (FIP)	102	104	101	94	1,725,000 ac-ft
Lewis and Clarke Lake (FIP)	98	96	96	93	477,000 ac-ft

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	End of Dec. 1976	End of Jan. 1976	End of Jan. 1975	Average for end of Jan.	Normal maximum
	Percent of normal maximum				
MIDCONTINENT REGION–Continued					
NEBRASKA					
Lake McConaughy (IP)	75	77	76	71	1,948,000 ac-ft
OKLAHOMA					
Eufaula (FPR)	78	79	96	84	2,378,000 ac-ft
Keystone (FPR)	75	79	91	91	661,000 ac-ft
Tenkiller Ferry (FPR)	105	102	103	88	628,200 ac-ft
Lake Altus (FIMR)	91	94	47	47	134,500 ac-ft
Lake O'The Cherokees (FPR)	81	73	82	78	1,492,000 ac-ft
OKLAHOMA–TEXAS					
Lake Texoma (FMPRW)	89	86	101	87	2,722,000 ac-ft
TEXAS					
Bridgeport (IMW)	88	87	58	42	386,400 ac-ft
Canyon (FMR)	94	93	98	65	385,600 ac-ft
International Amistad (FIMPW)	100	100	100	68	3,497,000 ac-ft
International Falcon (FIMPW)	98	94	100	72	2,667,000 ac-ft
Livingston (IMW)	100	100	99	65	1,788,000 ac-ft
Possum Kingdom (IMPRW)	92	91	94	97	569,400 ac-ft
Red Bluff (PI)	36	35	55	31	307,000 ac-ft
Toledo Bend (P)	87	90	97	76	4,472,000 ac-ft
Twin Buttes (FIM)	97	99	100	10	177,800 ac-ft
Lake Kemp (IMW)	81	82	47	89	268,000 ac-ft
Lake Meredith (FMW)	44	43	48	37	821,300 ac-ft
Lake Travis (FIMPRW)	92	93	100	78	1,144,000 ac-ft
THE WEST					
WASHINGTON					
Ross (PR)	86	83	68	52	1,052,000 ac-ft
Franklin D. Roosevelt Lake (IP)	100	97	90	76	5,232,000 ac-ft
Lake Chelan (PR)	88	76	36	44	676,100 ac-ft
Lake Cushman	97	94	78	84	359,500 ac-ft
Lake Merwin (P)	97	96	96	96	246,000 ac-ft
IDAHO					
Boise River (4 reservoirs) (FIP)	67	66	64	64	1,235,000 ac-ft
Coeur d'Alene Lake (P)	79	73	36	51	238,500 ac-ft
Pend Oreille Lake (FP)	52	59	45	55	1,561,000 ac-ft
IDAHO–WYOMING					
Upper Snake River (9 reservoirs) (MP)	70	65	71	63	4,689,000 ac-ft
WYOMING					
Boysen (FIP)	83	72	72	69	802,000 ac-ft
Buffalo Bill (IP)	66	64	64	65	421,300 ac-ft
Keyhole (F)	67	67	69	38	199,900 ac-ft
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	62	64	63	44	3,056,000 ac-ft
COLORADO					
John Martin (FIR)	2	2	1	15	364,400 ac-ft
Taylor Park (IR)	62	60	48	55	106,200 ac-ft
Colorado–Big Thompson project (I)	69	69	68	56	722,600 ac-ft
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Navajo, and Blue Mesa Reservoirs (IFPR)	81	80	70	.....	31,280,000 ac-ft
UTAH–IDAHO					
Bear Lake (IPR)	77	76	75	55	1,421,000 ac-ft
CALIFORNIA					
Folsom (FIP)	58	53	63	53	1,000,000 ac-ft
Hetch Hetchy (MP)	48	36	30	30	360,400 ac-ft
Isabella (FIR)	31	31	41	24	551,800 ac-ft
Pine Flat (FI)	47	47	49	50	1,014,000 ac-ft
Clair Engle Lake (Lewiston) (P)	77	75	76	81	2,438,000 ac-ft
Lake Almanor (P)	72	64	77	46	1,036,000 ac-ft
Lake Berryessa (FIMW)	85	85	86	84	1,600,000 ac-ft
Millerton Lake (FI)	63	71	60	64	503,200 ac-ft
Shasta Lake (FIPR)	70	68	28	71	4,377,000 ac-ft
CALIFORNIA–NEVADA					
Lake Tahoe (IPR)	71	67	63	51	744,600 ac-ft
NEVADA					
Rye Patch (I)	90	98	64	.....	157,200 ac-ft
ARIZONA–NEVADA					
Lake Mead and Lake Mohave (FIMP)	77	78	77	65	27,970,000 ac-ft
ARIZONA					
San Carlos (IP)	12	11	24	15	1,093,000 ac-ft
Salt and Verde River system (IMPR)	50	50	51	39	2,073,000 ac-ft
NEW MEXICO					
Conchas (FIR)	23	24	37	77	352,600 ac-ft
Elephant Butte and Caballo (FIPR)	24	30	18	28	2,539,000 ac-ft

[a] Thousands of kilowatt-hours

FLOW OF LARGE RIVERS DURING JANUARY 1976

Station number*	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1970 (cfs)	January 1976					
				Monthly discharge (cfs)	Percent of median monthly discharge, 1941–70	Change in discharge from previous month (percent)	Discharge near end of month		
							(cfs)	(mgd)	Date
1–0140	St. John River below Fish River at Fort Kent, Maine.	5,690	9,397	2,365	84	-52	2,000	1,300	31
1–3185	Hudson River at Hadley, N.Y	1,664	2,791	2,093	118	-44	3,000	1,900	31
1–3575	Mohawk River at Cohoes, N.Y	3,456	5,450	7,580	166	+10	.....	.....	....
1–4635	Delaware River at Trenton, N.J	6,780	11,360	20,110	196	+80	45,500	29,400	31
1–5705	Susquehanna River at Harrisburg, Pa.	24,100	33,670	38,620	127	+18	96,000	62,000	31
1–6465	Potomac River near Washington, D.C.	11,560	[1] 10,640	21,420	186	+163	9,730	6,290	31
2–1055	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	4,847	8,110	155	+75	18,000	11,600	31
2–1310	Pee Dee River at Peedee, S.C	8,830	9,098	13,400	134	+76	10,200	6,600	28
2–2260	Altamaha River at Doctortown, Ga.	13,600	13,380	18,410	129	+91	16,400	10,600	28
2–3205	Suwannee River at Branford, Fla	7,740	6,775	5,600	134	+71	5,810	3,760	29
2–3580	Apalachicola River at Chattahoochee, Fla.	17,200	21,690	31,500	123	+47	51,400	33,200	29
2–4670	Tombigbee River at Demopolis lock and dam near Coatopa, Ala.	15,400	21,700	46,820	161	+204	70,600	45,600	28
2–4895	Pearl River near Bogalusa, La	6,630	8,533	13,200	163	+69	12,000	7,800	31
3–0495	Allegheny River at Natrona, Pa	11,410	[1] 18,700	28,750	129	+2	48,900	31,600	29
3–0850	Monongahela River at Braddock, Pa.	7,337	[1] 11,950	25,430	151	+68	28,600	18,500	29
3–1930	Kanawha River at Kanawha Falls, W.Va.	8,367	12,370	18,820	121	+162	16,000	10,300	27
3–2345	Scioto River at Higby, Ohio	5,131	4,337	8,527	226	+111	19,000	12,300	27
3–2945	Ohio River at Louisville, Ky[2]	91,170	110,600	224,100	153	+71	215,300	139,000	28
3–3775	Wabash River at Mount Carmel, Ill.	28,600	26,310	37,000	167	+14	50,000	32,000	31
3–4690	French Broad River below Douglas Dam, Tenn.	4,543	[1] 6,528	9,490	119	+116	.....	.....	....
4–0845	Fox River at Rapide Croche Dam, near Wrightstown, Wis.[2]	6,150	4,142	4,236	122	+6	.....	.....	....
02MC002 (4–2643.31)	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y.[3]	299,000	239,100	246,900	111	-6	250,000	162,000	31
050115	St. Maurice River at Grand Mere, Quebec.	16,300	24,900	5,770	69	-63	25,600	16,500	26
5–0825	Red River of the North at Grand Forks, N. Dak.	30,100	2,439	1,705	217	-4	1,680	1,090	31
5–3300	Minnesota River near Jordan, Minn	16,200	3,306	443	92	-15	445	290	30
5–3310	Mississippi River at St. Paul, Minn	36,800	[1] 10,230	5,364	112	-12	5,580	3,610	29
5–3655	Chippewa River at Chippewa Falls, Wis.	5,600	5,062	3,960	144	-33	.....	.....	....
5–4070	Wisconsin River at Muscoda, Wis	10,300	8,457	6,535	116	-35	.....	.....	....
5–4465	Rock River near Joslin, Ill	9,520	5,288	3,725	108	-39	1,750	1,130	31
5–4745	Mississippi River at Keokuk, Iowa	119,000	61,210	35,220	106	-30	34,400	22,200	31
5–4855	Des Moines River below Raccoon River at Des Moines, Iowa.	9,879	3,796	390	69	-52	450	290	31
6–2145	Yellowstone River at Billings, Mont.	11,795	6,754	3,303	128	-20	3,300	2,100	31
6–9345	Missouri River at Hermann, Mo	528,200	78,480	40,400	123	-41	39,000	25,200	31
7–2890	Mississippi River at Vicksburg, Miss.[4]	1,144,500	552,700	711,700	133	+32	510,000	330,000	31
7–3310	Washita River near Durwood, Okla	7,202	1,379	520	114	+1	490	320	31
8–3130	Rio Grande at Otowi Bridge, near San Ildefonso, N.Mex.	14,300	1,530	630	103	-17	.....	.....	....
9–3150	Green River at Green River, Utah	40,600	6,369	2,669	146	-2	3,600	2,300	29
11–4255	Sacramento River at Verona, Calif	21,257	18,370	12,000	47	-45	9,600	6,200	28
13–2690	Snake River at Weiser, Idaho	69,200	17,670	22,220	149	+6	22,000	14,000	27
13–3170	Salmon River at White Bird, Idaho	13,550	11,060	5,355	127	-26	5,190	3,350	27
13–3425	Clearwater River at Spalding, Idaho	9,570	15,320	21,190	322	-24	19,500	12,600	27
14–1057	Columbia River at The Dalles, Oreg.[5]	237,000	194,000	201,300	179	+2	.....	.....	....
14–1910	Willamette River at Salem, Oreg	7,280	23,370	72,770	137	+17	52,480	33,900	27-31
15–5155	Tanana River at Nenana, Alaska	25,600	24,040	6,870	106	-2	6,400	4,100	29
8MF005	Fraser River at Hope, British Columbia.	78,300	95,300	40,900	120	-23	45,100	29,100	29

[1] Adjusted.

[2] Records furnished by Corps of Engineers.

[3] Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.

[4] Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.

[5] Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

*The U.S. station numbers as listed in this table are in a shortened form previously in use, and used here for simplicity of tabular and map presentation. The full, correct number contains 8 digits and no punctuation marks. For example, the correct form for station number 1–3185 is 01318500.

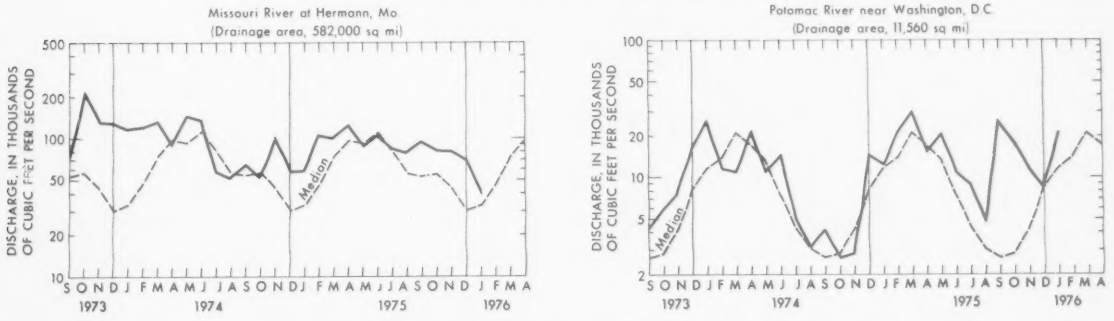
contrast, on the adjacent island of Oahu, monthly mean discharge of Kalihi Stream near Honolulu decreased contraseasonally, was only 20 percent of the January median flow, and was below the normal range for the 4th time in the past 6 months. In the eastern part of the State, monthly mean flow of Honopou Stream near Huelo, on the island of Maui, decreased and remained below the normal range. However, on the adjacent island of Hawaii, where monthly mean flow at the index station Waiakea Stream near Mountain View was less than median from May through December, flow increased sharply in January and the mean discharge was more than 3 times median and in the above-normal range.

METRIC EQUIVALENTS OF UNITS USED IN THE WATER RESOURCES REVIEW

(Round-number conversions, to nearest four significant figures)

1 foot = 0.3048 metre 1 mile = 1.609 kilometres
1 acre = 0.4047 hectare = 4,047 square metres
1 square mile (sq mi) = 259 hectares = 2.59 square kilometres (sq km)
1 acre-foot (ac-ft) = 1,233 cubic metres
1 million cubic feet (mcf) = 28,320 cubic metres
1 cubic foot per second (cfs) = 0.02832 cubic metres per second = 1.699 cubic metres per minute
1 second-foot-day (cfsd) = 2,447 cubic metres
1 million gallons (mg) = 3,785 cubic metres = 3.785 million litres
1 million gallons per day (mgd) = 694.4 gallons per minute (gpm) = 2.629 cubic metres per minute = 3,785 cubic metres per day

HYDROGRAPHS OF TWO LARGE RIVERS


Missouri River at Hermann, Mo.
(Drainage area, 582,000 sq mi)
DISCHARGE, IN THOUSANDS OF CUBIC FEET PER SECOND
500
200
100
50
20
10
Median
S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A
1973
1974
1975
1976
Potomac River near Washington, D.C.
(Drainage area, 11,560 sq mi)
DISCHARGE, IN THOUSANDS OF CUBIC FEET PER SECOND
100
50
20
10
5
2
Median
S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A
1973
1974
1975
1976

WATER RESOURCES REVIEW
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EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for January based on 22 index stream-gaging stations in Canada and 130 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations which are located near the points shown by the arrows.

Streamflow for January 1976 is compared with flow for January in the 30-year reference period 1931–60 or 1941–70. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow for January is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile).

Flow higher than the lower quartile but lower than the upper quartile is described as being within the *normal range*. In the Water Resources Review the median is obtained by ranking the 30 flows of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median.

The normal is an average (but not an arithmetic average) or middle value; half of the time you would expect the January flows to be below the median and half of the time to be above the median. Shorter reference periods are used for the Alaska index stations because of the limited records available.

Statements about *ground-water levels* refer to conditions near the end of January. Water level in each key observation well is compared with average level for the end of January determined from the entire past record for that well or from a 20-year reference period, 1951–70. *Changes in ground-water levels,* unless described otherwise, are from the end of December to the end of January.

The Water Resources Review is published monthly. Special-purpose and summary issues are also published. Issues of the Review are free on application to the Water Resources Review, U.S. Geological Survey, Reston, Virginia 22092.

THE 1973 MISSISSIPPI RIVER BASIN FLOOD: COMPILATION AND ANALYSES OF METEOROLOGIC, STREAMFLOW, AND SEDIMENT DATA

The abstract and graph below are from the report, *The 1973 Mississippi River basin flood: Compilation and analyses of meteorologic, streamflow, and sediment data*, by Edwin H. Chin (NWS-NOAA), John Skelton (GS), and Harold P. Guy (GS): U.S. Geological Survey Professional Paper 937, 137 pages, 1975; report prepared jointly by the U.S. Geological Survey and the National Oceanic and Atmospheric Administration. The report may be purchased for $7.10 from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

ABSTRACT

The severe 1973 spring flood in the Mississippi River basin had its beginnings in the mild, wet fall and winter of 1972. Many tributary streams and reservoir levels were well above normal throughout the basin when heavy spring rains began to fall. Frequent and prolonged warm rains associated with extratropical cyclones and frontal activities fell over large areas of the Mississippi basin in March and April 1973. The cumulative effect of these rainfalls led to the 1973 Mississippi River basin flood, characterized by its long duration, high volumes of runoff, and large coincident tonnage of sediment transported.

New records for consecutive days above flood stage were set for most main-stem gaging stations from southern Iowa to Louisiana. For example, the Mississippi River remained above flood stage for a record number of consecutive days at St. Louis, Mo. (77 days), Chester, Ill. (97 days), Thebes, Ill. (95 days), Memphis, Tenn. (63 days), and Vicksburg, Miss. (88 days). The total sediment discharge to the Gulf of Mexico during March through June was approximately 240 million tons, including 15 million into Lake Pontchartrain.

The 1973 main-stem flood stages were the highest ever observed in the reach of the Mississippi extending approximately 370 mi (595 km) upstream from Cape Girardeau, Mo. At St. Louis, Mo., for example, the maximum stage of 43.23 ft (13.177 m) exceeded the stage of 41.32 ft (12.594 m) that was observed in June 1844, and the flood peak of April 1785 that may have reached 42 ft (12.80 m).

Peak stages and discharges far exceeding the estimated values for the 100-year flood occurred in April 1973 on many tributaries in Wisconsin, Iowa, Illinois, and Missouri. Most tributary streams throughout the Mississippi River basin experienced some degree of flooding during March–May 1973, contributing to the outstanding main-stem flooding which continued into June (fig. 1).

Described in this report are the meterological setting of the flood, an account of the general characteristics of associated precipitation, and an analysis of a sample of significant precipitation events with return periods exceeding 100 years. The storm of April 19–21, 1973, with precipitation centered in northern Missouri, is analyzed as a case study. An estimation of evapotranspiration based on relevant meteorological factors indicated a probable reduction of such loss during the flood episode.

This report also contains summaries of stream stages, discharges, and flood volumes for gaging stations where outstanding flood events occurred and includes sediment data where available. The recurrence interval of the event is shown for many of the peaks and volumes. Also included are flood-profile data for the main stem and selected tributary streams.

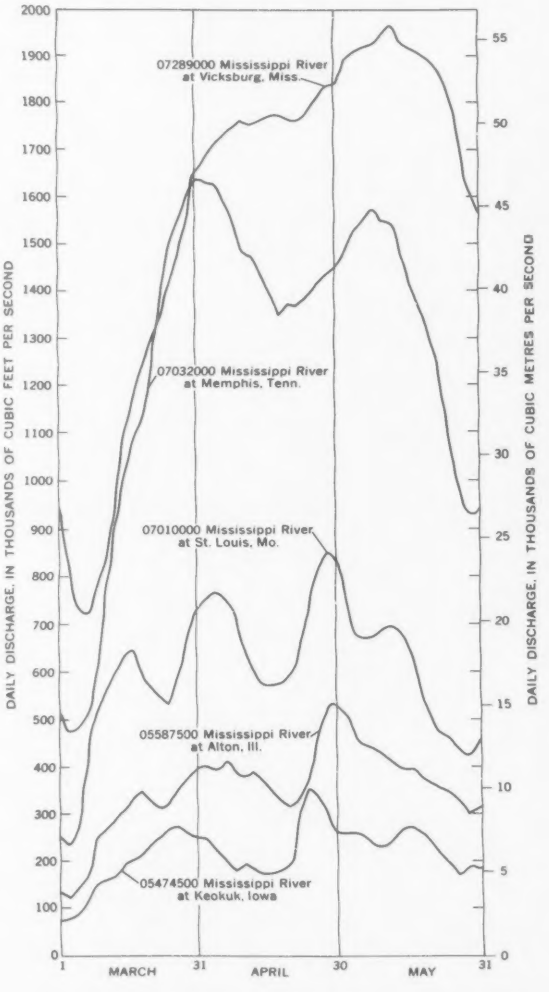

Figure 1.—Discharge hydrographs at selected gaging stations on the Mississippi River, March–May 1973.

INT: 3475–76